

REMARKS

Reconsideration of this application in light of the present amendment and remarks is respectfully requested.

Claims 14-20 are drawn to a non-elected invention and have been withdrawn.

Claims 1-13 have been rejected.

Claims 1-13 are pending in this application.

Substantive Matters

Claims 1-13 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Meny et al. U.S. Pat. No. 5,170,326 (hereinafter "Meny") in view of Walles et al. U.S. Pat No. 5,925,298 (hereinafter "Walles"). This rejection is respectfully traversed.

Applicants' invention solves the problem of reducing kinks (i.e. tight radius bends) in a flexible printed circuit board when it is fixed to a rigid substrate in an assembly and then bent (for example see US 6,483,037, Figs. 1-3). As should be realized, the finite thickness of the printed circuit board, as well as its affixing at a certain distance above the substrate (due to the thickness of the adhesive) will cause problems during bending. Inasmuch as the printed circuit is flexible and the substrate rigid, the flexible circuit board will distort much more than the rigid substrate during bending. In effect, during bending the flexible circuit board is forced to occupy a space with a smaller bend radius than the rigid substrate, which results in the printed circuit board distorting outwardly to contact the inside surface of the substrate causing kinking that can damage the printed circuit board. Even if the printed circuit board was infinitely thin, it would still interfere with an upper surface of the substrate during bending, causing kinks. Applicants' invention advantageously solves this problem by providing a recess or aperture extending outwardly from the inside surface of the substrate to accept the bendable region of the circuit board, as recited in claims 1 and 9.

Meny, although an improvement in the art, does not suggest or disclose the novel attribute of applicants' invention, namely providing a recess or aperture extending outwardly from the inside surface of the substrate to accept the bendable region of the circuit board, as is recognized by the Examiner.

Walles discloses providing recesses in the circuit board itself to facilitate bending of the board. Walles does not disclose a substrate, such as applicants' aluminum substrate. Therefore, Walles could not suggest or disclose providing an aperture or recess in a substrate to facilitate bending of an attached circuit board. Moreover, the substitution of Walles circuit board for

applicants' circuit board would not solve the problem solved by applicants' invention. For example, US 6,483,037 Fig. 1 also shows a circuit board with recesses 120, 150 to facilitate bending. Yet when mated with a substrate as shown in Fig. 2, and bent as shown in Fig. 3, such modified circuit board still results in kinks.

Alternatively, applying the knowledge of Walles' circuit board recess to applicants' substrate recess still would not solve the problem. Specifically, Walles cuts recesses in a planar circuit board which still results in a planar circuit board. This is quite insufficient for applicants' substrate as the recess must extend outwardly from the inside surface of the substrate past an originally-planar outside surface of the substrate in order to accept the bendable region of the circuit board. Walles does not provide such an aperture or recess in the circuit board, leaving the circuit board planar.

Therefore, if recesses were cut into the substrate, leaving the substrate planar, as done for Walles circuit board, the problem still would not be solved. For example, US 6,483,037 Fig. 1 also shows a substrate with recesses 162 cut therein to facilitate bending. Yet when mated with a circuit board as shown in Fig. 2, and bent as shown in Fig. 3, such modified substrate and circuit board still results in kinks. Walles' cuts are completely insufficient to solve the problem solved by applicants' invention. Moreover, applicants respectfully submit that it would not be obvious how to apply the cuts in the surface of a planar circuit board to providing non-planar pockets into a substrate.

Neither Meny nor Walles, in combination or alone, suggest or disclose the novel aspect of applicants' invention describing a recess or aperture extending outwardly from the inside surface of the substrate past an outside surface to accept the bendable region of the circuit board. None of the cited art, in combination or alone, contemplates or suggests an apparatus or method for reducing kinks in a circuit board. Thus, the cited art does not recognize the problem or solution provided by applicants' invention.

Therefore, applicants submit that the invention of independent claims 1 and 9 is novel and non-obvious over the cited art, and is therefore allowable.

Claims 2-8 and 10-12 are dependent on claims 1 and 9, respectively, and therefore include all of the recitations of those claims, which are not disclosed or suggested by the references, and are therefore allowable as well for the same reasons..

Accordingly, it is respectfully submitted that this rejection has been overcome.

The other references of record have been reviewed and applicant's invention is deemed patentably distinct and nonobvious over each taken alone or in combination.

For the foregoing reasons, applicants respectfully request that the above rejection be withdrawn.

Inasmuch as this amendment distinguishes all of the applicants' claims over the prior art references, for the many reasons indicated above, passing of this case is now believed to be in order. A Notice of Allowance is earnestly solicited.

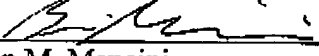
No amendment made was related to the statutory requirements of patentability unless expressly stated herein. No amendment made was for the purpose of narrowing the scope of any claim, unless applicant has argued herein that such amendment was made to distinguish over a particular reference or combination of references.

In the event that the Examiner deems the present application non-allowable, it is requested that the Examiner telephone the Applicants' attorney at the number indicated below so that the prosecution of the present case may be advanced by the clarification of any continuing rejection or through an Examiner's amendment.

Authorization is hereby given to charge any fees necessitated by actions taken herein to Deposit Account 50-2117.

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Respectfully submitted,
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